STDs: The Hidden Silent Killer

In recent times, knowledge and research about sexually transmitted diseases (STD's have become ubiquitous in society, especially in developed countries who have resources like the United States. Sex is a natural, biological process, and because of this, the idea that practicing something so natural and pleasurable to humans can bring deadly consequences has been heavily investigated for years now. It has been discovered that STDs come in many different forms, such as bacterial, viral and fungal. It has also been discovered that people who are in the minority when it comes to sexual preference such as gay men and lesbian women are more vulnerable to these diseases for various reasons. For one thing, they practice more nontraditional forms of sex that allow the diseases to spread easier on them than on people who practice more common forms of sex. Aside from the fact that members of the gay community might find it difficult to come out to their parents, let alone strangers who are medical professionals, and admit that they practice sex in different ways, it is still seen as taboo for young people to talk about sex and sex related things in general. This makes them especially embarrassed to speak up and it leads to combinations of unawareness and misinformation and further spread of sexually transmitted diseases. What many teens do not know is that a lot of the deadliest, most dangerous STD's do not show symptoms. So even if they tell themselves that they will do something when there is a visible problem, it still puts them at large risk.

As previously noted, one category of STD's comes from bacteria. To better understand bacterial STD's, it is advised to understand bacteria. Bacteria are extremely common organisms, in fact there are more bacterial cells in the human body than there are human cells. Not all bacteria are bad either, some are necessary for human survival and fight infections that might enter the body. They are even used in some foods. This is not to say that the harm bacteria can cause should be underestimated, as bacteria is still responsible for many harmful diseases, some of which are not even STD's. Antibiotics can be used to combat these, but the larger scale ones could harm good bacteria. It is also important to remember that antibiotics cannot be used to target viruses, because those are different from bacteria. Some bacteria are heterotrophs, and feast on other bacteria to survive. Other bacteria are autotrophs and make their own food. They have a cell wall to protect them, and a flagellum to help them move. Bacteria are prokaryotic, meaning that they do not have a nucleus or organelles like other cells do. They do, however, have a cell wall and ribosomes. These unicellular prokaryotes reproduce in a process called binary fission, a form of asexual reproduction that bacteria do in which the offspring's look exactly like their parents. Exceptions happen when there is a mutation, and these can actually make bacteria resistant to antibiotics and allow them to spread even more. This ability for bacteria to resist antibiotics is what aids them in harming the body when it comes to diseases like gonorrhea. There are many types of bacterial STD's, but one of the most

common is gonorrhea. Raja Nayaran, who has an MD in biostatistics, says that Gonorrhea is caused by a bacterium that can enter through the urethra and infect epithelial cells. This will cause white blood cells to come and fight the infection to prevent it from spreading. In theory, this should be the end of it, but gonorrhea attacks several parts of the urethra at once, and so many white blood cells will simultaneously go to fight it. This high level of activity will cause inflammation. In a study conducted by Christopher K. Fairley, Jane S. Hocking, Lei Zhang, and Eric P.F. Chow, it was found that gonorrhea was affecting homosexual men more than any other gender or demographic, therefore more awareness on the subject should be spread. One large reason given for the spread is that gay men have a tendency of not notifying their partners even when they know they have the disease. In another study conducted by Christine Kaestle and Martha Waller, approximately eleven thousand young adults had three aspects of their life analyzed: their identity, their sexual behavior and their sexual attractions. Over one thousand of these participants were experiencing or had recently experienced a bacterial STD. These individuals were then taken and studied further in order to evaluate if they had misperceived their risk for the bacterial STD they were suffering from. The results found that bisexual females who had recently had sexual relationships were at a higher risk for bacterial STDs than heterosexual females with similar amounts of sexual activity. Despite this, bisexual females were more prone to believe that their straight counter parts had a higher risk of bacterial STD's than them.

Viral STD's are different from bacterial ones because they cannot be cured with antibiotics, they can only have their symptoms alleviated through medical treatment. As implied in the name, viral STD's come from, well, viruses. Viruses have different shapes and structures, but all the variations share a few common elements. There is a molecule in viruses made up of nucleic acids that carries all of the virus's genetic information, and that molecule is surrounded by a protein layer for protection. There are four variations of viruses: icosahedral, enveloped, complex, and helical. An icosahedral shape consists of equilateral triangles positioned to make on large sphere. Icosahedral shaped viruses go into the environment after the cell dies and breaks down. An envelope shaped structure is like an icosahedral one, but it has a lipid bilayer, or a layer of fat, surrounding it hence the term envelope. Helical viruses have circular proteins surrounding them and have the overall shape of a tube. Complex virus structures can either be icosahedral or helical shaped. They can have a unique protective layer or a head and tail kind of structure. Only viruses that affect bacteria have the head and tail, and they are called bacteriophages. Bacteriophages will use their tail to create a hole in the cell wall of the bacterium, and use its tail to insert the harmful DNA into the bacterium. According to Laura J. Grimshaw, assistant medical director for an STD research center in Bronx, New York, human papillomavirus is the most common STD in the united states. There are over 6 million new cases annually and 75% of people ages 15-49 who are sexually active show evidence of exposure to the virus. Despite this, evidence indicates that knowledge about the disease is limited, with less only 30% of women even hearing about the disease and even less than that

having substantial knowledge on it. Grimshaw states HPV often does not show symptoms, and it makes people believe that they do not have it, making them inadvertently spread it to others. There are over 100 variations of this disease, and 40 of them are associated with infection in the genital tract. Cervical cancer cannot occur without the infection of HPV, which makes it crucial that they become more educated on it. According to the Center for Disease Control, it is more common for females to give the disease to males than vice versa, which means that the large ignorance to the disease from the women's part is causing HPV to spread throughout most genders. Most anal cancers are also associated with variations of HPV, and the variations of lowest risk still have a associations with warts and lesions. On a more positive note, simple protection measures like condoms have been associated with a statistical decrease in the risk of HPV, whether its directly by measuring the development of HPV, or indirectly by measuring the development of cervical cancer. Better than avoiding the spread of the virus is the prevention of its development in the first place. The HPV vaccine has been approved for use in the United States by since 2006. This vaccine only targets 4 variations of the disease, and it also noteworthy that it does not protect against ongoing infection.

One final, but not irrelevant category of STDs is fungal. To understand fungal STD's, it is important to understand fungi first. The structure, reproduction methods, and life cycle of fungi are all relevant to understanding fungal STDs. According to Lumen learning Fungi is eukaryotic, meaning that it has a nucleus and other organelles surrounded by a membrane, unlike bacteria which lack that. It is mostly made up of hyphae, which are microscopic threads that work together to make a more intricate web called the mycelium. The mycelium is still not big enough to be seen by the naked eye alone. Fungi can reproduce sexually or asexually. The most common asexual reproduction method for fungi is the production of asexual spores. These come from one parent through mitosis, making them identical to the parent. Genetic variation, a fungal offspring not being identical to its parent, comes from sexual reproduction. This usually occurs in response to varying environmental conditions. One of the most common fungal STDs is a yeast infection. According to Melissa Conrad Stoppler, a US certified anatomic pathologist, most cases of yeast infections come from the fungi Candida albicans. The remaining known yeast infections come from other Candida species. However, Candida is not an automatically harmful substance. An estimated 20% to 50% of healthy women already have it in their bodies. The infection happens when the amount of yeast and bacteria is altered, and the yeast overshadows the bacteria. This can be with any condition in the body that alters its chemical balance, including diabetes, pregnancy, and oral birth control. Yeast infections can also come as a result of injury to the vagina, and especially in women with suppressed immune systems. Yeast infections are very common in women, with 75% of them being affected at least once in their lifetime. Most women will experience itching as the most common symptom, but other symptoms include burning, vaginal discharge, and displeasure during sexual activity or urination. Since these symptoms are common for other STDs, the most accurate way to figure out what STD is causing the issues is to test the women's vaginal discharge in a laboratory.

Once it is a confirmed yeast infection, the person would want to start looking for solutions. To treat a yeast infection and alleviate the symptoms, there are antifungal oral and topical medications one can take. This also applies to men because women can infect them with yeast infections. Men might experience irritation on the skin of their penises if they acquire the infection. Yeast infections can be a painful and embarrassing experience for everybody, so the best course of action would be preventing one altogether. This can be done by keeping the vagina dry and clean at all times, as well as avoiding irritating chemicals. Dietary preventions can be taken by taking foods with probiotics. The most direct way to prevent a yeast infection is through the use of a condom. Many people, especially younger ones tend to shy away from discussing sex and protection. This ends up leaving them uninformed, and vulnerable to STDS.

Stds are a consequence of irresponsible or ignorant sexual behavior, but if one is ashamed of them, it will only become more difficult to deal with them. Younger people need to become more educated to prevent STDs in the first place, but they must also understand that staying silent will only make matters worse. Silence can cause the disease to spread further by infecting their sexual partners, and it can also become stronger in the person's body and possibly lead to death or permanent damage. Karin Coyle, Karen Basen- Enguist, and Douglas Kirby among others, a program called "Safer Choices" was implemented at a high school for 31 months with the objective of getting more students to practice safe sex. The biggest achievement of the program was an increase in condom usage. More students were using condoms with more partners, less were having unprotected sex, and there was a spike in measures against STD's overall. Ina U. Park, Camille Introcaso, and Eileen F. Dunne are all medics who specialize in STD prevention. They recommend an HPV vaccine for all 11 to 12 year olds, forcing people who are that young to start taking preventative measures against STD's and communicating about it to their parents or guardians who have to get them transportation to the clinic for treatment. Park, Introcaso, and Dunne also found that most people who are sexually active will have detectable HPV at least once in their lives, and that females are more likely to transmit the disease to males than vice versa. If younger people are not encouraged to research and reach out to prevent STD's, it could become a never leaving epidemic. Chapter 2 of a book titled Treatment of STI Associated Syndromes states that clinics should make resources for STD's more abundant, especially for teens because they have more sexual activity ahead of them compared to older people.